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munificently voted by the Parliament of Queensland, will be supported by geographers at home.

We shall also have brought before us much curious and novel information respecting vast regions of North-Western Brazil, watered by the Purus and other affluents of the Amazons, which will enlighten us with regard to the great extent of country in the interior of South America that yet remains to be explored. We expect, too, contributions regarding the geography of that portion of our globe which is considered to have been the birth-place of the human race—the western portion of Central Asia; for we are compelled to admit that we know really less of these countries than was known to the ancients, the recent labours of Russian explorers along the northern borders of Central Asia and the course of the Jaxartes revealing to us fresh knowledge as to the direction and nature of many mountain chains, and the course of several important streams, in that unknown region.

But these subjects will be more largely treated of in my anniversary address in May, and I now revert to the topic with which I began, and beg to direct your attention this evening exclusively to the bold and eminently successful explorations of Mr. Samuel Baker. I will only add that the sketches of scenery and the inhabitants which Mr. Baker has brought home with him are of the highest interest, and when published will ensure our commendation.

I now call on Mr. Baker to make his communication.

Mr. BAKER then read the following Paper:—

Account of the Discovery of the second Great Lake of the Nile, Albert Nyanza. By SAMUEL WHITE BAKER, Esq.

IN the year 1861 I commenced an expedition to discover the sources of the Nile, with the hope of meeting the East African Expedition of Captains Speke and Grant. I had not the presumption to make my intention public, as the Nile source had hitherto defied all explorers; but as the insignificant worm slowly bores its way into the hardest oak, even so I hoped by perseverance to reach the heart of Africa.

I employed the first year in exploring all the Nile tributaries from Abyssinia,—the Athara, Settite, Royān, Salaam, Angrab, Rahad, Dinder,—and thence descended the banks of the Blue Nile to Khartúm. I will not describe this journey, but will confine myself to the most important point—the Great White Nile.

I completed my arrangements at Khartúm, and started on the 18th December, 1864, with a powerful force in three vessels, with

twenty-nine transport animals, including horses, camels, and asses.

The first tributary to the White Nile is the Sobat, from the south-east, in lat. $9^{\circ} 21' 14''$ N. This river is 120 yards wide and 28 feet deep, with a current of $2\frac{1}{2}$ miles an hour, when bank-full, which it was at that time (December). It is not navigable for more than about 180 miles, as it is composed of seven or eight distinct streams, all shallow, the conjunction of which forms the main river.

Turning to the west from the Sobat junction, the Bahr Giraffe is met with on the south bank; this is an inferior stream, being a mere arm of the Nile, which leaves the parent stream in the Aliab country about $6^{\circ} 30'$ N. lat. Continuing west from the Bahr Giraffe we arrive at the Bahr Gazal junction coming from the west, about 70 miles from the Sobat junction. The Bahr Gazal is dead water. From that point to the south the difficulties of the White Nile commence. The entire country is a dead flat, a world of interminable marsh overgrown with high reeds and papyrus rush. Through this region of desolation the river winds its tortuous course like an entangled skein of thread; no wind is favourable, owing to the constant turns; the current adverse; no possibility of advance except by towing, the men struggling night and day through water and high rushes with the tow-rope, exhausted with a hopeless labour and maddened with clouds of mosquitoes.

Far as the eye can reach, in that land of misery and malaria, all is wretchedness. The dull croaking of waterfowl, the hum of insects, and the hoarse snort of the hippopotamus, impress the traveller that this is the mysterious Nile whose source lies hidden from mankind. Islands of vegetation silently float past, bearing solitary storks, thus voyaging on Nature's rafts from lands unknown. Nothing in life is so depressing as this melancholy river. One dry spot I saw slightly raised above the boundless marsh; there some white man was buried. The people were ignorant of his nation; but his bones, like a good ship stranded in her voyage, formed a sad landmark for the passer-by. Not far from that spot I also had to dig a muddy grave, and erect a rough cross over poor Johann Schmidt, a good and faithful German whom I had engaged for my expedition. He, at this early stage, fell a victim to the marsh fever—another wreck upon the fatal banks of the White Nile. The loss of a good man, my only European, so early in the voyage, affected me deeply. Sorrowfully I left him in that lonely spot, and struggled on against the stream to Gondokoro.

I arrived at Gondokoro after 45 days' voyage from Khartúm, about 750 miles in a direct line, lat. $4^{\circ} 55'$ N. I landed all my

animals in excellent order, and resolved to wait for the arrival of a trader's party from the south, according to my prearranged route, intending to form a dépôt at their station in latitude about $3^{\circ} 15' N.$, to which I could fall back for supplies in case of need.

Gondokoro is a miserable place, consisting of a number of grass huts, occupied only at one season by the traders' people, when they return from the interior with their slaves and ivory. The soil is poor, but the country is pleasantly diversified with many evergreen trees and native villages, while the distant mountains, towards the south and east, produce an exhilarating impression after the tedious White Nile marshes.

I had been 15 days waiting at Gondokoro, when suddenly I heard guns firing in the south, and my men rushed into my cabin, saying that the trader's party had arrived, with two white men—*Englishmen*—in their company, who had come from the sea! It is impossible to describe that moment. Quixotic dreams that I had cherished were now realised, and in a few minutes later I met those gallant explorers Captains Speke and Grant marching along the river's bank; arriving in honourable rags, careworn, haggard, but proud of having won.

Speke was my old friend, but I felt that his brave companion Grant was also an old friend, for such a meeting in the centre of Africa vanquishes all time, and the hearty shake of the hand effects more than the cold acquaintance of years. But one disappointment tinged this happy meeting. I had always hoped to have found them somewhere about the Nile source, and to have shared with them the honour of the discovery. I had my expedition in the most perfect order, and I was ready for any place however distant. Happily, much remained to be completed. Speke informed me that he had heard from the natives that a large lake existed to the west of Unyoro, which he thought might be a second source of the Nile, as the river flowed into it, and almost immediately after its junction issued from it, and continued its course to Gondokoro. He also said that he and Grant crossed the river at Karuma Falls in about $2^{\circ} 20' N.$ lat., where they lost the river as it turned suddenly to the west; therefore it was of the highest importance to explore it from that point to the lake, which he called the Luta N'zigé. I immediately determined to undertake this exploration, feeling convinced that the reported lake had an important position in the basin of the Nile.

My hopes of success were considerably damped by the character of my men. In those unknown regions every species of villainy can be perpetrated unpunished, and a collection of scoundrels, including Europeans, were engaged in the so-called ivory trade,

having armed bands of ruffians in their service, who not only robbed the natives of their women and children to sell as slaves in the Soudan, but whose ivory purchases were conducted by *razzias* upon the cattle of the natives, the animals thus stolen being exchanged for elephants' tusks with the adjoining tribes. The trade of the White Nile is simply cattle-stealing, slave-hunting, and murder.

I had thus to encounter two great difficulties: the hostility of the natives, caused by the above conduct, and the impossibility of procuring porters for beads and bracelets, cattle being the only medium of exchange; added to this, my men engaged at Khartúm as escort were the scum of the earth, accustomed to cattle-lifting and slave-hunting, and in the habit of receiving from their employers one-third of the cattle stolen. Foreseeing these difficulties when at Khartúm, I had applied, through the British Consul at Alexandria, to the Egyptian Government for a few troops as escort. This application was refused, although the Dutch ladies obtained Government soldiers and an officer through the application of the *French* Consul at Khartúm.

A few days after the departure of Speke and Grant from Gondokoro, my men mutinied and refused to proceed. The traders had combined to prevent any European traveller from penetrating the interior, fearing reports upon the slave trade. The people of Andrea Debono, who, having escorted Speke and Grant, had agreed to give me porters and to accompany me to their camp, suddenly started without me, sending a message that they would fire upon my party should I attempt to follow on their path. My armed men, forty in number, kept forcible possession of my arms that were in their hands, and threatened to fire at me simultaneously should I attempt to disarm them. It appeared utterly hopeless to proceed. The Bari tribe at Gondokoro and for about four days south were hostile to all comers. My expedition, so carefully organised, was overthrown and apparently defeated. The fatality that had attended all expeditions to the Nile sources for two thousand years hung heavily upon me.

I had no longer an escort. One man alone was faithful: he was a native of the Djour. This man and a little black boy of twelve years old were all that remained of my party, with the exception of my wife, who, with a devotion which woman alone can show, determined to face all dangers and hardships rather than that we should return defeated.

I will not weary you with a minute account of how, by management and caution, I recovered my arms and ammunition from the mutineers. Having succeeded in frightening a few of them, seven-

teen agreed to follow me to the *east*. My proper course was south ; but I agreed to the proposal of the men, as they obstinately refused to proceed in any direction but east. I discovered that they had conspired to desert me at the camp of a trader, seven days' march east from Gondokoro : this was their reason for insisting upon that direction. They had also threatened to fire at me should I attempt to disarm them on the road, and to desert my wife in the jungle after my death. Nevertheless, it was imperative that I should advance from Gondokoro at all hazards, or give up the expedition. I trusted to gain an influence over my men when once in the interior, and to be able then to alter my course to the direction of the lake.

I endeavoured to make terms with a trader's party bound for the east, but failed ; they sent word that they would fire at me if I followed their route, and that they would raise the Ellyria tribe against me in advance. This party started on the 26th of March, 1863, at about 2 P.M., and I determined to follow on their tracks that night and take my chance of overcoming all obstacles on the road. Not a single native was procurable, all being under the influence of the traders ; thus I had neither guide nor interpreter. I loaded my camels and asses, and at 7 P.M. followed in the direction the traders' party had taken.

I overtook them that night, bivouacked upon the road, and I pushed on ahead. The next morning I received two natives of the Latooka tribe, who, having been ill-treated by the Turks, had absconded. Fortunately I had been kind to these very men when in Gondokoro, and they, being natives of the country to which we were bound, offered to act as guides for a large present of beads and bracelets. Here, then, were guides ! and I determined to push on by a forced march at night to reach and pass through the Ellyria tribe before the Turks should arrive to raise that tribe against me.

The march of that night was heavy. The camels were carrying about 700 lbs. each ; the asses 200 lbs. I had twenty-nine animals. The route was through jungle and obstructed by numerous ravines, in crossing which the camels always fell and had to be unloaded. While they were being reloaded the tired donkeys took the opportunity of reposing and lying down ; they shifted all their packs, which thus had to be readjusted a dozen times in that one night's march.

The day broke, and we were still ahead of the Turks. I lightened the loads, throwing away most of the salt and about 300 lbs. of all kinds of provisions, which, being left on the road, had the double advantage of lightening the burthens and delaying the Turks, who

I knew would scramble and fight together for the spoil upon the route. At length I passed a place called Tollogo, about 30 miles east of Gondokoro, and threading a rocky pass at the foot of a range of fine granite mountains, I passed on to Ellyria, riding about a mile ahead of my party.

Tying our horses to a tree, my wife and I, alone in this beautiful spot, sat upon one of the huge blocks of granite that had fallen from the mountain top, and looked down upon the valley of Ellyria, about a mile before us. The noble mountains of grey granite rose on the borders of the chief village, while numerous other villages, surrounded by bamboo stockades, were dotted about the steep sides of the mountains. Looking down upon this valley in which our fate lay hidden, we anxiously awaited the arrival of our party—the road being difficult for the baggage animals, owing to the numerous fragments of rock which blocked the pass. We were exulting in having outmarched the Turks before they could raise the Ellyria tribe against us, when a clattering among the rocks preceded the appearance of what I supposed to be our party. To my confusion I saw the hated red flag and crescent, leading the Turks' party of 140 men. One by one they filed by through the narrow pass and descended to Ellyria. We were outmarched, and the expedition ruined should they raise the chief against us, he being the man who had massacred a trader's party of 126 armed men the year previous.

The captain of the party at length passed within a few yards of me in the rear of his men: my success depended upon that moment. I called him, and a present of a double-barrelled gun opened the conversation; it was terminated by English gold, which by good fortune I had with me—I had won him! I explained to him that it was impossible to drive me back, but should he assist me in my journey, I would reward him far beyond his annual salary. My men shortly arrived, and were confounded at seeing that I had made a friend of one of my greatest enemies.

After seven days' march we arrived at Latooka, my party slightly in the rear of the trader's. We reached the station of Chenooda, an opposition company to that which I had been following. It was at this spot that my men had conspired to mutiny. At daybreak the next morning the men refused to load the camels, and broke out in open mutiny with their arms in their hands. I made a severe example of the ringleader and thus cowed some of the party, while some absconded with their arms and ammunition and joined Chenooda's men. The party of Chenooda made an attack upon the Latookas two days later, to procure slaves; but the Latookas, who are a splendid tribe, massacred them, entirely destroying 105 men, in-

cluding four of my deserters. This event gave me the control of my remaining men, who, firmly believing in the "evil eye," imagined that I had some mysterious connection with this disaster.

Latooka is the finest country that I have seen in Africa: the natives are warlike, but friendly if well treated. A large tract of land is cultivated with several varieties of grain, enormous herds of cattle find ample pasturage, and the towns are large and thickly populated. Tarrangollé, the chief town, contains about 4000 houses. Every town is defended by a strong stockade, while sentries are posted day and night around the town upon high platforms. The men are, like all tribes of this part of Africa, completely naked, and they are distinguished from other tribes by a peculiar head-dress—the hair or wool being worked into a thick felt and arranged as a helmet; this is tastefully arranged with blue and red beads, and ornamented with polished copper plates. The Latookas never bury the dead if slain in fight: those who die a natural death are exhumed after a few weeks' interment—the bones are then placed in earthenware pots and exposed outside the town. Like all other tribes of the White Nile they have no idea of a Deity, nor even a vestige of superstition; they are mere brutes, whose only idea of earthly happiness is an unlimited supply of wives, cattle, and a kind of beer.

The country of Latooka is important as being on the east frontier of a mountain-range running from the south-east, which forms the watershed between the White Nile and the Sobat; the drainage to the east flowing to the Sobat, about 50 miles distant, by the River Kanieti, and that to the west flowing direct to the Nile. This mountain-range is from 4000 to 5000 feet high, and composed entirely of granite. My intention in leaving Gondokoro for this country was simply to make a move into the interior, whence I trusted to be able to change my route and work round to the south-west to Unyoro, and from thence to the lake. Accordingly I crossed the mountain-range, and steering south-west 40 miles from Latooka I arrived at Obbo in lat. $4^{\circ} 2' N$. The general level of the Obbo country is 3600 feet above the sea: it forms the watershed between the East and West, and has a great rainfall of ten months during the year. The soil being extremely rich, the country is covered with an impenetrable grass jungle, about 12 feet high, intermingled with wild grape-vines. The mountains are clothed with forests, the whole country abounding in elephants.

Cattle will not live, owing to the tsetse fly: thus the natives are inferior in strength to the Latookas, being badly fed. They are extremely indolent, and, instead of cultivating their beautiful soil, they are contented with small patches of a wretched grain and a

harvest of wild yams, which grow in abundance. I found nine varieties of yam growing wild in the Obbo jungles.

The chief of the Obbo tribe is an old man, a famous magician and rain-maker, much respected by all adjacent tribes as a powerful sorcerer. He carries a whistle of antelope's horn, which is supposed to have the power of either bringing or preventing rain. Unfortunately one day I happened in his presence to whistle shrilly with my fingers with a tone which utterly overpowered his magic horn. From that time I was considered to be an accomplished rain-maker, and was always requested to perform either to attract or to retard a shower. The old chief "Katchiba" has 116 children living, and all his villages are governed by various sons. When he visits a district he rides on a man's back, with a few attendants, while one of his wives carries a jar of beer to refresh both horse and rider. He thus journeys through his country to collect tribute: if not paid, he curses the goats and fowls of his subjects, that they may remain barren, and threatens to withhold the rain.

In Obbo the whole of my transport animals died, and I was utterly helpless. After a delay of many months, during which the rainfall was exceedingly great, I procured a few porters from the ivory trader, and having trained some riding oxen, I was prepared to start for Unyoro. I was forced to abandon nearly all my baggage, as my means of transport were very limited. My clothes and those of my wife had long since been bartered for provisions with the trader's men; thus my baggage was light, consisting of a simple change of linen, with a large supply of ammunition, and presents for the King of Unyoro (Kamrasi). I had been a martyr to fever, and my quinine was exhausted; my work still all before me. I had arranged to lead the trader's party into the Unyoro country, and to introduce them to Kamrasi, under the express conditions that they should deal fairly with the King.

We left Obbo on January 5, 1864, crossing the River Atabbi, which is an important tributary to the Asua River, flowing throughout the year. I passed through the Madi country to Shooa, in latitude $3^{\circ} 4' N.$, crossing the Asua River in lat. $3^{\circ} 12' N.$ The Asua at that time (January 9) was dry, with the exception of a narrow stream, ankle-deep, trickling down its rocky bed. It is about 120 yards wide, but it is a simple mountain-torrent. The average depth in floods, judging by the water-mark on the banks, is 15 feet; so great is the inclination of its bed, that it forms a rapid during the rains, impassable by boats. The bed of the river was 1100 feet lower than Obbo; the drainage of a large extent of country thus flows to the Asua, and thence to the Nile.

Upon arrival at Shooa the whole of my porters deserted: this necessitated a further diminution of baggage. Rice, coffee, and every necessary, was forsaken, and, with a few men to carry ammunition and blankets, we pushed forwards towards Unyoro.

After five days' journey south, over uninhabited prairies of high grass and countless swampy hollows, we arrived at the Nile* at Karuma Falls, at the very spot where Speke and Grant had crossed the river, in latitude $2^{\circ} 17' N$. Instead of being welcomed by Kamrasi, as I had expected, we were not allowed to cross the river; crowds of armed men thronged the heights on the opposite bank to resist our landing. At length, after a long day lost in gesticulating and shouting our peaceful intentions, a boat came across the river with some head-men of the country, who, after strict examination, pronounced me to be Speke's own brother, "from one father and one mother." It now transpired that Debono's men, who had escorted Speke and Grant to Gondokoro the previous year, and who had driven me from my southerly route, had marched direct to Unyoro and attacked Kamrasi's country, killing about three hundred people, and capturing many slaves. We were at first supposed to be some of that party. So strong was the suspicion of the natives, even after my examination, that none of our party were allowed to cross the river except my wife, myself, and two or three attendants. It was pitch-dark when we landed on the south bank just under Karuma Falls; and although met by a crowd playing upon flutes, horns, and drums, apparently with great rejoicing, we were detained for eight days before we were allowed to journey south to Kamrasi's residence.

From Karuma the Nile flows due west in a succession of powerful rapids between high cliffs. Immense groves of bananas clothed the steep ravines, and beautiful forest-trees, interspersed with varieties of palms, bordered the beautiful river, rushing along its rocky bed. Here the Nile was about 150 yards wide, a noble stream fresh from the Victoria Lake.

My first wish was to follow the river from this point to the supposed Luta N'zigé, but this was not permitted; neither could I obtain information of any kind from the people, as they had not yet received the King's orders. So suspicious was the King, that we were twelve days on a march of only 40 miles due south to his

* As that portion of the Nile which flows from the Victoria, into the Albert Nyanza, requires a separate name to distinguish it from the main river of the Nile flowing out of the Albert Nyanza, I have, on my map, adhered to the name Somerset River, given to it by its discoverer Captain Speke on the map which he gave me at Gondokoro, and which I have handed over to the Royal Geographical Society.

capital. We were only allowed to march about $3\frac{1}{2}$ miles per day, to enable messengers to report our conduct daily to Kamrasi. This march was on the west bank of the Nile, and we arrived at the capital (M'rooli), at the junction of the Kafoor River with the Nile. The country throughout our route from Karuma was thickly populated and extremely fertile.

The King did not appear for three days, during which we were by his orders confined on a wretched marsh on the south side of the Kafoor River, precisely where Speke and Grant were located formerly. In rather a suspicious manner Kamrasi arrived, accompanied by about a thousand men. I was very ill with fever, and was carried on a litter to his hut. He was a fine, dignified-looking fellow, well dressed in bark-cloth, gracefully draped around him, and beautifully clean in his person; the nails of his hands and feet being perfectly white, and carefully attended to. He gave me seventeen cows, and a quantity of plantain wine; accordingly, I presented him with a variety of objects of value, including a handsome Persian carpet of most gorgeous colours, which captivated him immensely. I told him that Speke and Grant had arrived safely, and had spoken well of him, therefore I had come to thank him in the name of my country, and to present him with a few curiosities. I also told him that the Queen of my country had taken a great interest in the discovery of the Nile source, now proved to be within his dominions, and that I wished to visit the Luta N'zigé Lake, and descend to the junction and the exit of the river. He told me that Speke was evidently my brother, having a beard precisely similar; that I was far too ill to attempt the march to the lake—which was the *M'wootan*, not *Luta N'zigé*—as it was *six months' journey*; that he was afraid I might die in his country, and perhaps my Queen would imagine I had been murdered, and might accordingly invade his territory. I replied that this was a perfectly correct idea—that no Englishman could be murdered with impunity; but that I had resolved not to leave his country until I had seen the lake, therefore the sooner the exploration was completed, the less chance there would be of my dying in his country.

I returned to my hut disheartened. I had now been fourteen months from Khartúm, struggling against every species of difficulty; for twelve months I had been employed in repairing guns, doctoring the sick, and attending the wounded of the ivory hunter's party, simply to gain sufficient influence to enable me to procure porters. That accomplished, I had arrived at this spot, M'rooli, in lat. $1^{\circ} 37' N.$, only 6 days' march from the Victoria Lake; and I had hoped

that a 10 days' westerly march would enable me to reach the M'wootan N'zigé. I now heard that it was *six months' journey*! I was ill with daily fever, my wife likewise. I had no quinine, neither any supplies, such as coffee, tea, &c.; nothing but water and the common food of the natives—good enough when in strong health, but uneatable in sickness.

That night passed heavily; the following morning, to my dismay, every one of my porters had deserted. They had heard the King declare the journey to the lake to be *six months*, and all had absconded. Day after day I had interviews with the King Kamrasi, whose only object in seeing me was to extort all I had. I gave him everything he asked for except my sword: this was what he coveted.

The traders obtained a large quantity of ivory and left the country, leaving me, with my thirteen men, sick and hopeless. I would not be persuaded to return: I felt sure that the lake was not so far distant. Hearing that the trade from the lake consisted of salt, I found a native dealer, and from him I obtained the cheering information that the lake was only 15 days distant. The King had deceived me, merely wishing to detain me with him in order to strip me of everything. At length I gave him the coveted sword and a double-barrelled gun; my head-man drank blood with him as a proof of amity, and he gave me two chiefs as guides and about three hundred men as escort. These fellows were dressed like our juvenile ideas of devils, having horns upon their heads, and were grotesquely got up with false beards made of the bushy ends of cows' tails. This motley escort gave much trouble on the journey, plundering the villages *en route*, and drawing all supplies before we had a chance of procuring anything: I therefore discharged my attendants after a few days' march, and continued the journey with my guides and porters. Every day the porters, apparently without reason, would suddenly throw their loads down and bolt into the high grass, disappearing like so many rabbits. This occasioned much delay, as fresh men had to be collected from distant villages.

Marching for some days along the south bank of the Kafoor River, we had to cross this deep stream at a muddy ford; in crossing this river my wife suddenly fell apparently dead, struck by a *coup de soleil*. For seven days she was carried in a state of insensibility along our melancholy route; the rain in torrents, the country a series of swamps and forest and grass jungle—no possibility of resting in one place, as there was nothing to eat on the road and our provisions were insufficient. The people put a new handle to

the pickaxe to dig her grave, and looked for a dry spot. I was utterly exhausted with fever and watching, and, after a long march, I fell senseless by the side of her litter. The next morning a miraculous change had taken place, which I can never forget.

After 18 days' journey through a park-like country from M'rooli, the long-wished-for lake was announced by the guide. For three days I had seen a high range of mountains, apparently about 80 miles distant, and I had feared that these lay between me and the lake; to my great joy I now heard that they formed the opposite or western shore. Suddenly, upon reaching some rising ground, the great reservoir of the Nile lay before me! Far below, some 1500 feet beneath a precipitous cliff of granite, lay my prize so hardly sought; a boundless sea-horizon south and south-west; while west, the faint blue mountains, of about 7000 feet above the water-level, hemmed in the glorious expanse of waters.

Weak and exhausted with more than twelvemonths' anxiety, toil, and sickness, I tottered down the steep and zigzag path, and in about two hours I reached the shore. The waves were rolling upon a beach of sand; and as I drank the water and bathed my face in the welcome flood with a feeling of true gratitude for success, I named this great basin of the Nile (subject to Her Majesty's permission) the "Albert Nyanza," in memory of a great man who had passed away. The Victoria and the Albert Lakes are the reservoirs of the Nile.

Vacovia was the spot where I first reached the lake, in lat. $1^{\circ} 14' N.$ From that place I started in canoes, and, steering north, I coasted for 13 days, arriving at Magungo, in lat. $2^{\circ} 16' N.$ There the lake had decreased in width to 16 or 20 miles, and it turned to the west; the extent unknown to the natives.

The village of Magungo was situated on rising ground about 250 feet above the lake; from this spot I had a beautiful view of the valley of the Nile, as the river flowed from the lake from 15 to 20 miles due north of our position. The valley was 4 or 5 miles wide; a great flat of green reeds marked the course of the river to the north as far as the eye could reach. A chain of hills bounded the west bank of the river, trending north-east. Below the village of Magungo the river which I had crossed at Karuma entered the lake, after a course of about 80 miles from Karuma Falls; thus the Nile entered the lake and almost immediately made its exit at the north, precisely as had been reported by the natives to Speke and Grant.

My voyage down the lake had been tedious, owing to the heavy sea which rose with the wind from the south-west every afternoon,

and rendered it necessary to haul the canoe ashore. The scenery was extremely beautiful; the mountains of granite and gneiss rose in many places abruptly from the water to the height of 1200 to 1500 feet on the east shore; many streams rushed down precipitous ravines; and the fine cataract of the Kaigiri, in a grand body of water, fell from about 1000 feet. Two large falls were visible with the telescope, issuing from the high range of mountains on the west shore; in fact, all nature seemed to recognise this great depression as the grand reservoir.

Much salt is obtained from the soil on the east bank of the lake; this forms the sole article of trade of the population on its borders. Formerly Magungo was a town of considerable importance, as the trade from Karagwé, from 2° s. lat., was conducted in large boats sent by Rumanika, the king of that country, with cowrie shells and brass bracelets from Zanzibar in exchange for ivory. My interpreter (a woman of Magungo) told me that she had seen Arabs arrive at Magungo with those boats, who regularly brought cowrie shells every year in exchange for ivory and prepared skins. In a disagreement with the people some men were killed, and from that time no boats had arrived; thus cowrie shells were very scarce, and tribes to the north, *i.e.* the Madi and Obbo, who formerly sent to Magungo to purchase those shells, were now without a supply.

Kamrasi, and many natives, told me that the lake is known well as far as Karagwé; but from that part, between 1° and 2° s. lat., it turns to the west, the extent being unknown even to Rumanika, the King of Karagwé. Thus the Albert Lake is well known to an extent of about 260 geographical miles from south to north. Throughout this course it receives the drainage of a great equatorial mountain-range, where the rainfall continues through ten months of the year. When I reached the lake in March, it was shortly after the commencement of the rains (which begin in February); at that time the water was 4 feet below the highest water-mark upon some trees which grew in the lake near Magungo. The natives assured me that the level was never lower than at the time I saw it; thus the maximum rise of the water-level in floods is 4 feet. From the exit of the Nile to lat. 3° 32' N. the Nile is navigable.

It was necessary to verify the river flowing into the lake at Magungo as the Nile I had crossed at Karuma, that being the river flowing from the Victoria Nyanza. At the junction with the Albert Nyanza it was a broad channel of dead water, banked by vast masses of high reeds. In fact the northern end of the Albert Lake seemed to form a delta, the shores being blocked with rush-banks.

The whole character of the lake had changed from the open sea it had presented further south.

I went up the river from Magungo in a canoe. After the first 10 miles it had narrowed to a width of about 200 yards, without any perceptible stream. We slept that night on a mud-bank, within a few feet of the river; but on waking the next morning I distinctly noticed the floating vegetation slowly moving towards the west. Thus there was no doubt that this was actually the Karuma River, as the natives had informed me, flowing into the lake at Magungo.

About 25 miles from Magungo my boating terminated. For many hours I had heard the roaring of broken water; we now turned into a slight bend of the river, and the grand fall of the Nile rushed into our view. Hurrying through a gap in a granite rock the river contracted suddenly from a width of 150 or 200 yards to about 50 yards, forming a maddening rapid, which, roaring through its rock-bound channel, plunged in one leap, about 120 feet perpendicular, into a deep basin below. I took the liberty of naming this grandest object throughout the course of the Nile the "Murchison Falls."

I counted twenty-seven crocodiles upon one sandbank below the falls. I shot one, and, as we were putting the boat ashore, a hippopotamus which had been hidden in the reeds charged the canoe, lifting it out of the water, and very nearly terminated the voyage with a capsize.

Leaving the canoes at a small fishing-village below the falls, we continued our route to the east, overland, parallel with the river. The war was raging between Kamrasi and a neighbouring chief, Fowooka, who lived upon some islands in the river. The whole country was plundered and deserted; my porters absconded, leaving us in utter helplessness without provisions. Here, laid down with fever and starvation, we remained for two months, living upon wild spinach and mouldy flour, now and then procuring a wretched fowl. During this time Kamrasi, who was camped with an army of 5000 men only four days distant, sent me repeated messages that I was to attack his enemy, Fowooka, with my guns. Should I accede to this, he promised to give me all I wanted, even to a portion of his kingdom. Being in extremity, I at length sent my head-man to the King's camp with a message that I was far too great a man to be negotiated with by a third party, and that if Kamrasi wished me to fight his battles, he must send fifty men to carry me to his camp, as I was too ill to walk; we might then come to some understanding as to the proposed

alliance. This bait took, and after some days I was carried to his camp and well supplied with provisions.

A few nights after my arrival there was a sudden uproar in the camp—hundreds of war-drums beating, horns blowing, and a mass of people dressed for battle, with horns upon their heads, and false beards; crowds rushed to and fro in the darkness, screaming and dancing with their spears, in the utmost confusion. Suddenly the king arrived in my hut, with a piece of blue baize tied round his loins like a kilt. This baize had been given him by Speke, and he confessed that he was thus lightly clad to enable him *to run away* quickly. It appeared that 150 of the trader Debono's scoundrels, armed with guns, had allied themselves to Fowooka, and, having crossed the river, were within 10 miles of our camp, together with several thousand natives marching against Kamrasi. I never saw any man in such a pitiable fright as the King. I hoisted the English ensign upon my flag-staff opposite my hut, and assured him that no harm should befall him if he would trust to its protection; at the same time I sent five of my men to summon the captain of Debono's party to appear. The men returned on the following day with ten men of Debono's, who candidly confessed their intention of killing Kamrasi and of capturing slaves. I declared the country to be under the protection of the British flag, and that I would hang the leader at Khartúm should one slave or head of cattle be stolen from Kamrasi's country. I gave them twelve hours to recross the river to the north side.

Curious to say, they submitted unconditionally; but, determined not to return without some booty, they actually attacked and plundered their own allies, after retreating across the river. This affair gave me immense influence with Kamrasi, but it did me much harm. I was so valuable to him that he would not allow me to leave his country. The season for the annual boats to depart from Gondokoro was passed, and I was a prisoner for twelve months until the following season. This was quite heartbreaking.

During this time M'tesa, the king of Uganda, had heard that I was on the way to visit him with presents, but that Kamrasi had detained me and received the presents intended for him; he therefore invaded Unyoro with a large army, and utterly devastated the country. Nothing would induce the coward Kamrasi to fight, and he took refuge on a river-island, forsaking me utterly, and not even supplying me with porters. I determined to push for Karuma and form a strong camp in the angle made by the bend of the river above the falls; but the enemy were on the road, we had no animals to ride, the oxen being all dead, and although weak and ill, my unfortunate wife and I

were obliged to make a forced march throughout the whole night, stealing through the high grass on the skirt of the enemy's camp.

Arrived at Karuma, I sent messengers to the traders who had accompanied me the previous year. They shortly arrived and received from Kamrasi an immense amount of ivory which I had arranged he should give them. M'tesa's army retreated at the approach of the Turks' party of 150 guns, and I left Kamrasi's country on my road home. He had stripped me of everything except my guns and ammunition, and his last request was that I would give him the English flag that had saved him from the Turks. I was obliged to explain to him that the talisman failed unless in the hands of an Englishman.

In passing through the Bari tribe, on my return to Gondokoro, we were twice attacked by the natives, who surrounded the camp and complimented us with a few showers of poisoned arrows. A good shot or two from the sentry settled the matter, and we arrived safe at Gondokoro—the exploration thus happily concluded.

I have now a task to perform which weighs heavily upon me—it is to deliver to the President of the Royal Geographical Society a map which was given to me by my lamented friend Captain Speke previous to his departure from Gondokoro. This map is the last relic that I possess of that great explorer, and I had fondly hoped to have delivered it into his own hand and to have publicly thanked him for the great service it has rendered me. Alas! instead of meeting him, I see a subscription list for a monument to his memory. He being gone, I feel the deepest satisfaction in being able to substantiate the main points of his discoveries. So vast is Central Africa, and so insurmountable are the difficulties of that savage country, that it is impossible for a single party to complete so great an exploration as the sources of the Nile. I can only pay a just tribute to the extraordinary perseverance and determination of Captains Speke and Grant in having overcome obstacles which none but an African explorer can appreciate. Not only have they laid down upon this map what they have actually seen, but I have determined the correctness of their information, gathered from the natives, respecting the course of the river from Karuma to the Albert Lake, and its subsequent exit from that lake on its course to the Mediterranean. To these great explorers belongs the honour of discovering the Victoria Nile-source.

For myself I claim no honour as the discoverer of a *source*, as I believe the mighty Nile may have a thousand sources. The birth-place of that great river is the vast rock-basin of the Albert Nyanza.

In those profound depths, bosomed in the mountain-range of

Equatorial Africa, in a region of ten months' rainfall, every drop of water, from the passing shower to the roaring mountain-torrent, is stored in that great reservoir of Nature. Fifteen hundred feet below the general level of the country, in a precipitous depression, lies the great reservoir of the Nile. So vast is its volume of water, that no single stream appears to influence its level. Even the great river from the Victoria Lake enters the great reservoir absorbed without a perceptible current.

I will not enter upon vain theories of a connection between this lake and the Tanganyika, nor indulge in any wild hypothesis that may mislead the public. I wish to lay before the world the simple and straightforward narrative of my expedition for the benefit of geographical science, trusting that nearly five years passed in toil and anxiety in Central Africa have been of service in determining the great Basin of the Nile.

The PRESIDENT was sure that all he said in praise of his distinguished friend would be considered feeble, now that the Meeting had heard his simple tale of what he had accomplished. He perceived by the applause which they had awarded to Mr. Baker that they entered into the feelings which he had entertained for a long time in watching the progress of this remarkable man. And he knew that they would approve of the course taken by the Royal Geographical Society, which he was proud to have been the first to suggest,—that whilst Mr. Baker was engaged in his great work they awarded to him the Victoria Medal, in the belief that if he lost his life the medal would remain for ever with the family as a memorial of his great enterprise. In conversation with Mr. Baker, he had drawn from him several anecdotes some of which he was sure would have interested the Meeting if he had related them. He had told them how he had succeeded in overcoming the opposition of King Kamrasi, but he had not told them in what way he had done it. He had with him a Highland uniform, kilt, sporran, and all; and by putting on this dress, he so dazzled the barbarous monarch that he obtained all he wished. When Mr. Baker's book came to be published, he was sure they would say that he was worthy to be placed alongside the lamented Speke; and it was the delight of his heart that he had determined the observations of that great traveller to be correct. Many gentlemen present might wish to ask questions respecting the country, and he was sure Mr. Baker would be most happy to answer them. In the mean time they returned him their hearty thanks.

Mr. GALTON said he wished to ask for a few additional particulars. First, in regard to the relative sizes of the river that runs into the Albert Nyanza and the river that runs out of it: by knowing this, a good idea might be obtained of the proportion of water afforded to the Nile by either lake. He should also be glad if Mr. Baker would give a somewhat fuller description of the general appearance of the extraordinary lake-basin of the Albert Nyanza,—whether there are boats on the water or ferries across it, and whether the shores are frowning shores like those of the Lake of Lucerne. The last question he would ask was with reference to such tribes as Speke and Grant had not made us acquainted with; further information on this subject was very desirable. No doubt, Mr. Baker had seen specimens of the tribes who lived on the opposite side of the Albert Nyanza; and it would be a matter of great ethnological interest to learn if they were materially different from the other tribes of which we have heard.

Mr. BAKER said Mr. Galton, as an old African traveller, must know how very difficult it is to form any opinion, without actually measuring a river and the force of its stream, as to the quantity of water which it may carry down in a given time. Especially difficult is it in the present instance, because the river is so full of obstructions in the shape of rocks that its capacity cannot be ascertained without elaborate measurements. Captain Speke made use of the expression with regard to the Nile near the junction of the Asua "a Highland stream." If anybody had seen the Tay at Dunkeld, they would obtain a fair idea of the river which flows into Lake Albert Nyanza. But as to the river which issues from the lake, it appeared to him from a distance as occupying a broad valley 4 or 5 miles in width. This width he imagined was continued for a great distance, because from an elevation of about 250 feet he could see to the horizon nothing but this broad valley of green reeds. When he said green reeds, they must fully understand the characteristic of the White Nile, which has a certain amount of clear channel, but a greater portion of its breadth concealed by reeds about 20 feet in height. Therefore it is a most difficult thing to form any idea of the volume of water that is carried down, three parts of it being concealed by vegetation. When he reached the Nile near the famous Miani's tree, he saw the river from an elevated ridge of nearly one thousand feet stretching away upwards towards the lake for a distance of 40 miles. It was so broad at this spot that with a heavy rifle he could not reach a group of elephants standing on an island in the middle of the stream. He estimated its width at a mile and a half. Lower down he found the river contracted to a width of 120 yards with a current of 10 miles an hour and a depth unknown. After leaving Khartúm, below the junction of the Blue Nile with the White Nile, the river passes through a gap between basalt hills, where with a pistol he could kill a goat across the river: it is, certainly, not more than 80 yards wide at that part, and the natives say there is a depth of 600 feet. This exemplifies how difficult it is, without actual measurement, to form any idea of the volume of water brought down by the stream. With regard to the general character of the lake, it is an abrupt depression 1470 ft. below the general level of the country. It gives the idea of a great volcanic gap produced by some convulsion of Nature, which has raised the mountains on each side and created a depression in their midst. This gap naturally forms a lake by receiving the drainage from a vast mountainous country. In many places the waves wash against the precipitous rocky shores which rise to the height of about 1500 feet above the level of the waters. The whole lake lies in a rocky basin; in fact, the hollow may be described as a huge cleft. On the other side of the lake rises a large chain of mountains whose bases he could not discern, as they were 50 or 60 miles distant; he could only see mountains apparently rising from the water. But at the exit of the river these mountains disappeared, giving rise to undulations like the Malvern Hills. Where the lake turns to the west, at its northern end, it occupies an apparent gap in those mountains; for, on the opposite side of the gap, is distinctly seen a continuation of the chain, which stretches as far as Gondokoro. Descending the Nile from Gondokoro there is no other mountain to be seen as far as Khartúm, a distance of 750 miles.

With regard to the tribes inhabiting the opposite shores of the lake—the Mallega, the M'Caroli, and the Koshi—the Koshi are a savage tribe, resembling the Madi. But the differences between the various tribes is not so much in physical conformation as in the mode of dressing the hair and ornamenting themselves. Many disfigure themselves by cutting holes in their lips and sticking straws in them. Others, again, will stick long pieces of crystal in the lower lip. Mallega is a very large country; much more powerful and of greater extent than Uganda and Unyoro: it is, however, perfectly unknown except to the traders of the country. The people of Mallega

have been known to cross the lake opposite to Vacovia in very large boats or canoes belonging to the King of Mallega. But the natives assured him that they seldom crossed, because it took four days' hard rowing to accomplish the distance. Taking 15 miles a day, that would give 60 miles as the breadth of the lake at that point. These people prepared skins most beautifully by rubbing them with the hand so that they become like chamois leather. Skins so prepared are of very great value, and find their way down to Karagwé. The natives of Karagwé are in the habit of sending boats across the lake for the purpose of getting skins, to purchase ivory. As to the characteristics of the Mallega people he could say nothing; the few individuals he saw appeared similar to the subjects of Kamrasi.

The PRESIDENT said, he wished to say, as a geologist, that Mr. Baker's discovery was a very remarkable one with respect to that science to which he had been so long attached. The Albert Nyanza, unlike the Victoria Nyanza, unlike the N'gami, and nearly all the lakes in the centre of Africa, which lie in depressions on plateaux with sedgy borders, is a deep rock-basin subtended by granitic and gneissic rocks, and resembling, on a grander scale, the deep fresh-water lochs in Scotland. It was important to geologists to find that a deep and vast rocky basin of this nature exists under the Equator. Certainly, whatever theorists have written about ice excavating deep rock-basins, this is one of those cases in which ice-action is out of the question. He called attention to this, because that theory of ice-excavation had excited a great deal of discussion in other places. There was another point to which he wished to call attention. Mr. Baker had alluded to Miani's tree. This Venetian, M. Miani, had endeavoured to show that Speke had not seen the tree which he had marked with his name, and had maintained that he had penetrated a great deal farther south than Speke had given him credit for. He also described another river as being the main stream of the White Nile. Mr. Baker is able to assure us that the latitude given by Speke as the position of Miani's tree was perfectly correct, and that the point which the Venetian traveller attained lies much farther to the north than Miani had maintained it to be.

MR. BAKER said he had abstained from mentioning the name of Signor Miani, except casually, in the course of his observations. He made a point of saying as little as possible against any person, especially against any African traveller. It is generally supposed that we are apt to catch fever in Central Africa. There is another epidemic that travellers are liable to be seized with; and that is, disparagement of the labours of others. Therefore, he had not said in his paper what it was necessary now to say in answer to the President's remark. This was that he had taken especial pains to fix the position of Miani's tree, and had determined by observations that it stood in north latitude $3^{\circ} 32'$. From that tree Mr. Miani turned back, as the interpreter had informed him, because his stock of biscuits was consumed. He himself (Mr. Baker) happened to have the same interpreter who had accompanied Miani.

The PRESIDENT.—Is it not a matter of fact that Mr. Miani never got farther south than $3^{\circ} 32'$ north?

MR. BAKER.—Precisely so: $3^{\circ} 32'$ north.

Heights of Stations above the Mean Level of the Sea determined by Boiling-water Observations by S. W. BAKER, Esq., computed by E. DUNKIN, Esq., of Greenwich Observatory.

	Feet.
Tarrangollé	2047
Obbo	3480
Shoggo	3770
Asua River	2619
Shooa	3619
Rionga's Island	3685
Karuma, below falls	3737
„ „ south of falls	3796
South of Karuma, at river level	3794
M'rooli, river level, junction of Kafoor	3796
West of M'rooli, on road to Albert Lake	4291
Land above lake, east cliff	4117
Albert Nyanza, lake level	2448
Shooa Morru, island of Patooān	2918
Gondokoro	1636

The above heights will be found to differ considerably from those given by Mr. Baker in his letter, written from Khartúm in May last and published in the 'Times' newspaper in June. This arises from Mr. Baker having corrected his observations, whilst in the interior of Africa, from what have since proved erroneous data: the above are the correct computations of the same observations.

Remarks on the Thermometer B. W., used by Mr. S. W. Baker in determining Heights. By Staff-Commander C. GEORGE, Curator of Maps, Royal Geographical Society.

THIS thermometer was one of the three supplied by the Royal Geographical Society to Consul Petherick, in 1861, and was made by Mr. Casella.

At Gondokoro, in March, 1862, it was lent to Mr. Baker, who made all his observations with it and brought it back safe: it has, therefore, been in use about 4½ years.

On November 9th, 1865, Mr. Baker returned it to the Royal Geographical Society, and it was immediately taken to Mr. Casella, who tested its accuracy by trying its boiling point, in nearly the same manner as Mr. Baker had made his observations. The result by two independent observers was that the boiling point had increased in its reading by 0·75 in 4½ years, or 0·172 yearly.

On November 23rd the thermometer was again tested by Mr. Baker at the Kew Observatory. The observation was made under the same conditions as those near the Albert Nyanza as nearly as it was possible to make it.* The result gave the thermometer 0°·80 too much at the boiling-point.

The readings of the thermometer have, therefore, been *too much*, and by *reducing* the readings, it *elevates* all positions at which observations were made.

Table No. 1.—In this Table the error obtained at Kew Observatory has been treated like that of a chronometer, the error being assumed increasing and regular.

Table No. 2 is to correct the height, computed by Mr. Dunkin, using the quantity taken from No. 1 Table.

Table No. 3 is the final result of the observations for height, corrected for instrumental error.

* By immersion in boiling water.

TABLE No. 1.—Table for Increased Reading of Thermometer, using 0°·80 as the Result of Observations for its Error.

Month.	1861.	1862.	1863.	1864.	1865.
January	0°·143	0°·314	0°·487	0°·659
February	°·157	°·328	°·501	°·673
March	0°·000	°·172	°·344	°·516	°·688
April	°·014	°·186	°·358	°·530	°·702
May	°·028	°·200	°·372	°·544	°·716
June	°·043	°·214	°·387	°·559	°·730
July	°·057	°·228	°·401	°·573	°·744
August	°·071	°·243	°·415	°·587	°·758
September	°·086	°·257	°·430	°·602	°·772
October	°·100	°·271	°·444	°·616	°·786
November	°·114	°·285	°·458	°·630	0°·800
December	0°·129	0°·300	0°·473	0°·645	..

TABLE No. 2.—At the elevation of 3500 feet, 1° equals about 520 feet, from which the following Table :—

°		Feet.	°		Feet.	°		Feet.
1·0	520	°·7	364	°·3	156
°·9	468	°·6	312	°·25	130
°·8	416	°·5	260	°·2	104
°·75	390	°·4	208	°·1	52

TABLE No. 3.

Date.	Name of Place.	Approximate Position.		Reading of Thermometer, B. F.	Temperature.	Height.		
		Latitude.	Longitude.			Baker.	Dunkin.	Kew Correction.
		° ' "	° ' "	°		feet.	feet.	feet.
April 13, 1863	Tarrangolle (Latooka)	4 30 N.	32 55 E.	208.5	89	2003	2047	189
May 6 "	Obbo (camp)	4 02 "	32 31 "	206.0	76	3365	3480	194
" 12 "	Shoggo (Farajoke)	3 32 "	32 32 "	205.5	75	3643	3770	196
Jan. 12, 1864	Asua River	3 12 "	32 11 "	207.5	82	2543	2619	256
" 15 "	Shooa	3 4 "	32 4 "	205.8	82	3522	3619	258
" 22 "	Rionga's Island, 80 feet above river..	2 18 "	32 9 "	205.7	84	3400	3685	259
" 25 "	Karuma, below falls (Atada)	2 15 "	32 26 "	205.6	82	3637	3737	259
" 31 "	" south of falls, on road to M'rooli	2 10 "	32 29 "	205.5	84	3708	3796	260
" 31 "	" south of, at river level	1 53 "	32 26 "	205.4	84	3766	3794	260
Feb. 21 "	M'rooli, river level junction of Kafoor	1 38 "	32 20 "	205.5	82	3695	3796	265
Mar. 9 "	West of M'rooli, on road to Albert Lake..	1 13 "	31 24 "	204.5	80	4254	4291	271
" 12 "	Land above lake, forming east cliff	1 15 "	30 51 "	204.8	80	4065	4117	271
" 14 "	Albert Nyanza, lake level	1 14 "	30 50 "	207.8	84	2388	2448	272
April 7 "	Shooa Morru (Island Patoöan)	2 16 "	31 55 "	207.0	84	2843	2918	277
Mar. 21, 1865	Gondokoro*	4 54 "	31 46 "	209.2	86	1592	1636	363

* Dr. Beke, in the 'Sources of the Nile,' published in 1860, from page 30 to 36, investigates the levels of the Nile from Cairo to Gondokoro; at page 36 he makes the latter place 1911 feet above the level of the sea—a remarkable confirmation of the above.

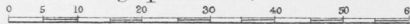
A MAP OF THE ALBERT N'YANZA

AND OF THE ROUTES
LEADING TO ITS DISCOVERY
IN 1864.

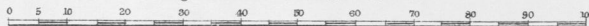
BY SAMUEL WHITE BAKER, ESQ.

SCALES.

Geographical Miles, 60 = 1°



English Statute Miles 69.1 = 1°



Mr Baker's Route —————

The Avoca and Kibi, two large rivers are reported by the natives to run to the N. W. from a chain of mountains in these parts.

At Magungo the Lake was seen to extend towards low ground on the N. W. but its limits are unknown.

M' C A R O L I

M A K K A R I K A

M A L L E G G A

King Kajoro

Two large falls visible with telescope from Eastern shore.

2000 feet?

The Lake was calm every day till 1p m. when a S.W. gale arose, and compelled the canoes to be hauled ashore.

Vacovia

March 16. 1864.

Coasted by Mr. B. in Canoes in 7

1500 feet high

much higher than this shore

A series of Swamps

Ge

the middle of the lake

the middle of the lake

Date of d

Re go

K O S

Former trader's barrow

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